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16. ABSTRACT

Selected life history data has been tabulated to allow the utilization of such data - characterizing relationships among and with selected species. The data presented were collected for the express purpose of testing a hypotheses about the tolerance of species to toxicants. Much of what we have learned about species and their relationships to their environment is encompassed by expressions of their adaptation to differing environments and to environmental changes.

The data presented is from life history studies and may be useful to other scientists studying importance of adaptive processes and general species differences. Data includes species name, maximum size and maximum number of eggs produced by individual females within a population. Data is presented on 450 populations among 177 species.

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The purpose of assembling certain selected life history attributes of fish species is to allow the utilization of such data in characterizing relationships among and within those same species. Much of what we have to learn about species and their relationships to their environments is encompassed by expressions of their adaptation to differing environments and to environmental changes. These expressions include life history attributes among others.

Such data as longevity of individuals within populations of a species, maximum size attained by individuals within a population and the maximum number of eggs produced by individual females within populaitons have proven useful in conjecturing about survival strategies and, indeed, testing hypotheses about those survival strategies. The data presented in Table 1 of this paper were collected for the express purpose of testing a hypothesis about the tolerance of species to toxicants. The usefulness of this data to others cannot be guaged until they are made available in the open literature and others will have had the opportunity to utilize them for their unique purposes.

This data set is not exhaustive. Several important sources of life history data, notably United States Government publications, publications of state academies of science and state conservation agencies were not examined. However some 450 populations among 177 species are repre-

sented.

It is clear that of the life history studies done most were on species of either commercial or recreational importance and if this compilation of data is a fair representation of all such life history data available on North American fishes then we have hardly scratched the surface and the data certainly do not cover all ecological niches. The data do, however, cover a broad spectrum of longevities, sizes and fecundities.

The data presented in Table 1 are reported directly from life history studies in the published literature or indirectly from published compilaitons of life history studies (care was taken not to duplicate data where this effort had access to both). The life history attributes presented are in years for longevity, grams for maximum weight attained and number of eggs per female for maximum fecundity. The data were reported directly from life tables, age-growth tables and reproduction data tables or they were calculated from relationships presented in the studies such as length-weight relationships and by expanding eggs per unit weight of female by maximum weight attained by females.

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Table 1. Longevity in years, maximum weight attained in grams and maximum fecundity of fish as reported in the literature.

FAMILY Species	Age	Wt.	Fec.	Reference
ACIPENSERIDAE				
Acipenser brevirostrum	26	4125		Taubert 1980
Acipenser fulvescens	65	37194		Royer et al 1968
Acipenser transmontanus	71	45772		Semakula and Larkin 1968
AMMODYTIDAE				
Ammodytes dubius	8			Winters 1981
ANGUILLIDAE				
Anguilla anguilla	7	840		Rossi and Villani 1980
Anguilla rostrata	20	800	20000000	Carlander 1969
Anguilla rostrata	18	1614		Hurley 1972
Anguilla rostrata			2561000	Wenner and Musick 1974
APHREDODERIDAE				
Hypostomus plecostomus	3	7		Shepherd and Huish 1978
ATHERINIDAE				
Menidia extensa	2	2	150	Davis and Louder 1969
BRAMIDAE				
Brama japonica		2354		Manzer 1972
CALLIONYMIDAE				
Callionymus belcheri	3		1710	Johnson 1972
CARANGIDAE				
Trachurus symmetricus	10			Kaiser 1973
CARCHARHINIDAE				
Carcharhinus falciformis			6	Bane 1966

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
CATOSTOMIDAE				
Carpiodes carpio			35000	Behmer 1969
Carpiodes carpio	20	3062	154038	Carlander 1969
Carpiodes carpio		4536		Schrenkeisen 1963
Catostomus ardens			38525	Andreasen and Barnes 1975
Catostomus catostomus	11		35000	Bailey 1969
Catostomus catostomus	8			Brown and Graham 1953
Catostomus catostomus		3175		Eddy and Underhill 1974
Catostomus catostomus	19	3311	60307	Harris 1962
Catostomus catostomus	8			Kathrein 1950
Catostomus columbianus	9		21040	Dauble 1980
Catostomus commersoni	17	2585		Beamish 1973
Catostomus commersoni	12			Beamish and Harvey 1969
Catostomus commersoni	12	3147	140000	Carlander 1969
Catostomus commersoni	8			Kathrein 1950
Catostomus commersoni	5			Lewis and Elder 1952
Catostomus commersoni		3200	50000	McPhail and Lindsey 1970
Catostomus discobolus			21227	Andreasen and Barnes 1975
Catostomus microps	4		12590	Moyle and Marciochi 1975
Erimyzon oblongus	7	750	32970	Wagner and Cooper 1963
Ictiobus bubalus	14	12928		Carlander 1969
Ictiobus bubalus		3175		Eddy and Underhill 1974
Ictiobus bubalus	12	18144		Harlan and Speaker 1956
Ictiobus bubalus	8	621		Purkett 1957

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Ictiobus bubalus		15876		Schrenkeisen 1963
Ictiobus cyprinellus	20	24494	750000	Carlander 1969
Ictiobus cyprinellus		36288		Eddy and Underhill 1974
Ictiobus cyprinellus	20	11600	750322	Johnson 1963
Ictiobus cyprinellus		22680		Schrenkeisen 1963
Moxostoma anisurum	9	1665		Meyer 1962
Moxostoma atripinne	4	60	1755	Timmons and Ramsey 1983
Moxostoma duquesnei	10	390	4150	Bowman 1970
Moxostoma erythrurum	7	5000	35000	Carlander 1969
Moxostoma erythrurum	4			Lewis and Elder 1952
Moxostoma erythrurum	7	1360		Meyer 1962
Moxostoma macrolepidotum	12	2554	29732	Carlander 1969
Moxostoma macrolepidotum	8	3077		Meyer 1962
CENTRARCHIDAE				
Ambloplites rupestris	10	394		Beckman 1946
Ambloplites rupestris			500	Gross and Nowell 1980
Ambloplites rupestris	12			Ryan and Harvey 1977
Ambloplites rupestris		907		Schrenkeisen 1963
Ambloplites rupestris			12000	Eddy and Underhill 1974
Lepomis cyanellus	6			Lewis and Elder 1952
Lepomis cyanellus	5			Purkett 1957
Lepomis cyanellus		113		Schrenkeisen 1963
Lepomis gibbosus	8	179		Beckman 1946
Lepomis gibbosus		680		Schrenkeisen 1963
Lepomis macrochirus	10	226		Beckman 1946

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Lepomis macrochirus		2154	67000	Eddy and Underhill 1974
Lepomis macrochirus		680		Schrenkeisen 1963
Lepomis megalotis		283		Trautman 1957
Lepomis megalotis	5			Lewis and Elder 1952
Lepomis microlophus	5			Gerking 1952
Lepomis microlophus		312		Trautman 1957
Micropterus dolomieui	9	1103		Beckman 1946
Micropterus dolomieui		4990		Eddy and Underhill 1974
Micropterus dolomieui	12	1984		Fraser 1955
Micropterus dolomieui		2721	17465	Harlan and Speaker 1956
Micropterus dolomieui	11	2223		Henderson and Foster 1956
Micropterus dolomieui		4082		Schrenkeisen 1963
Micropterus punctulatus	6	439		Olmsted and Kilambi 1978
Micropterus salmoides	9	1319		Beckman 1946
Micropterus salmoides	8			Cole 1966
Micropterus salmoides		3629	40000	Eddy and Underhill 1974
Micropterus salmoides			8036	Kelley 1962
Micropterus salmoides	13			Mraz and Threinen 1955
Micropterus salmoides	7			Smagula and Adelman 1983
Pomoxis annularis		1814		Eddy and Underhill 1974
Pomoxis annularis	8	575	147800	Mathur et al 1979
Pomoxis nigromaculatus	8			Beckman 1946
Pomoxis nigromaculatus		2268	140000	Eddy and Underhill 1974
Pomoxis nigromaculatus	6			Huish 1953

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
CLINIDAE				
Heterostictius rostratus	7	380		Coyer 1982
CLUPEIDAE				
Alosa pseudoharengus	9	437	102800	Carlander 1969
Alosa pseudoharengus	5		100000	Eddy and Underhill 1974
Alosa pseudoharengus	4	33	80000	Norden 1967
Alosa psuedoharengus		400		Schrenkeisen 1963
Alosa sapidissima	11	6804	616000	Carlander 1969
Alosa sapidissima		1520		Davis 1980
Alosa sapidissima	6			LaPointe 1957
Alosa sapidissima		6350		Schrenkeisen 1963
Alosa sapidissima				Walburg 1961
Clupea harengus	11			Davey 1972
Clupea harengus harengus	9			Cote et al 1980
Clupea harengus harengus			92000	McKenzie 1964
Clupea harengus harengus	23			Olsen 1961
Dorosoma petenense	4			Johnson 1970
Dorosoma petenense			4000	Johnson 1971
Dorosoma petenense			14000	Kilambi et al 1969
Sardinops sagax		52		Farris 1956
COTTIDAE				
Clinocottis analis			1300	Hubbs 1966
Cottus aleuticus		1	298	Ikusemiju 1975
Cottus asperrimus	5		245	Daniels and Moyle 1978
Cottus bairdi	5			Zarbock 1951

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Cottus cognatus	7		339	Craig and Wells 1976
Cottus cognatus			653	Foltz 1976
Myoxocephalus scorpius	15			Ennis 1970
Myoxocephalus scorpius	11		60976	Ennis 1970
CYCLOPTERIDAE				
Liparis pulchellus		92	9196	Johnson 1969
CYPRINIDAE				
Agosia chrysogaster	3	10	417	Lewis 1978
Couesius plumbeus	6		2104	Brown et al 1970
Couesius plumbeus	5			McPhail and Lindsey 1970
Cyprinus carpio	47	26990	2208000	Carlander 1969
Cyprinus carpio	13	10217		Crivelli 1981
Cyprinus carpio	11			Crivelli 1980
Cyprinus carpio		22680	2000000	Eddy and Underhill 1974
Cyprinus carpio	8			McConnell 1951
Cyprinus carpio	8	442		Purkett 1957
Cyprinus carpio			591000	Swee and McCrimmon 1966
Dionda nubila	2	8	888	Glazier and Taylor 1980
Gila atraria	8			Graham 1961
Gila atraria	11			Neuhold 1955
Gila robusta elegans	7	367		Vanicek and Kramer 1969
Gila robusta robusta	7	368		Vanicek and Kramer 1969
Meda fulgida	4		1749	Barber et al 1970
Notropis analostanus			4268	Gale and Buynak 1978

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Notropis atherinoides	3	9	8733	Campbell & McCrimmon 1970
Notropis atherinoides	2	11		Carlander 1969
Notropis atherinoides	2	37		Fuchs 1967
Notropis atherinoides	4			McPhail and Lindsey 1970
Notropis chihuahua	2		892	Burr and Mayden 1981
Notropis hudsonius	3	23	2600	Calander 1969
Notropis hudsonius	3		1300	McCann 1969
Notropis hudsonius	3			McPhail and Lindsey 1970
Notropis longirostris	2		129	Heins and Clemmer 1976
Notropis longirostris	2		323	Heins et al 1980
Notropis nubilus	2	8	888	Glazier and Taylor 1980
Notropis petersoni	3		328	Davis and Louder 1971
Notropis scepticus	3	6	1164	Harrell and Cloutman 1978
Notropis stramineus	3		1800	Carlander 1969
Notropis stramineus	3		340	Summerfelt et al 1969
Notropis umbratilis	2		887	Matthews and Heins 1984
Phoxinus erythrogaster			12500	Phillips 1969
Phoxinus neogaeus	6		2556	Stasiak 1978
Pimephales notatus	3	9	5000	Carlander 1969
Pimephales notatus			1000	Eddy and Underhill 1974
Pimephales notatus			4195	Gale 1983
Pimephales promelas	3	13	12124	Carlander 1969
Pimephales promelas	3		6000	Eddy and Underhill 1974
Pimephales promelas			10164	Gale and Buynak 1982

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Pimephales promelas	2	14		Held and Peterka 1974
Ptychocheilus lucius	11	1848		Vanicek and Kramer 1969
Rhinichthys cataractae	5		870	Brazo et al 1978
Rhinichthys cataractae	5		680	Carlander 1969
Rhinichthys cataractae			1200	McPhail and Lindsey 1970
Rhinichthys cataractae	5			Reed 1959
Semotilus atromaculatus	7	340	4671	Carlander 1969
Semotilus atromaculatus	3			Lewis and Elder 1952
CYPRINODONTIDAE				
Cyprinodon diabolis		1	65	Minckley and Deacon 1973
Fundulus luciae		1071	210	Kneib 1978
Fundulus majalis	7		540	Carlander 1969
Fundulus majalis	7	70		Clemmer and Schwartz 1964
Fundulus zebrinus	2		40	Minckley and Klassen 1969
DASYATIDAE				
Dasyatis centroura		272727		Bullis & Struhsaker 1961
Gymnura micrura		31818	7	Daiber and Booth 1960
Gymnura micrura	6			Daiber and Booth 1960
EMBIOTOCIDAE				
Cymatogaster aggregata	5	53		Anderson and Bryan 1970
Hyperprospon argenteum	6	207		Anderson and Bryan 1970
Phanerodon furcatus	7	284		Anderson and Bryan 1970
Phanerodon furcatus	7	365		Banerjee 1973
ESOCIDAE				
Esox americanus americanus	7	211	4364	Crossman 1962

Table 1. (cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Esox americanus americanus			3716	Crossman 1966
Esox americanus vermiculatus			15732	Crossman 1966
Esox lucius	10	5684	147501	Bregazzi and Kennedy 1980
Esox lucius	24	24040	272160	Carlander 1969
Esox lucius	3			Diana 1983
Esox lucius		22680	100000	Eddy and Underhill 1974
Esox lucius	10	9935	234470	Mann 1976
Esox lucius	25	22226		McPhail and Lindsey 1970
Esox lucius		18144		Schrenkeisen 1963
Esox lucius	8	3344		Wolfert and Miller 1978
Esox masquinongy	30	31640	265000	Carlander 1969
Esox masquinongy	9			Crossman 1956
Esox masquinongy	9			Harrison & Hadley 1979
Esox masquinongy	9			Muir 1963
Esox masquinongy	6			Parsons 1959
Esox masquinongy		45360		Schrenkeisen 1963
Esox masquinongy	14	14983		Simard and Magnin 1968
Esox masquinongy	14			Spangler 1968
Esox masquinongy	15	31724	100000	Eddy and Underhill 1974
GADIDAE				
Gadus macrocephalus	7			Kennedy 1970
Gadus macrocephalus			3215000	Thomson 1962
Gadus morhua	16			Fleming 1960
Gadus morhua	22	27895		Patriquin 1967
Lota lota	12	2873	900000	Bailey 1972

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Lota lota	15			Beamish and Chilton 1977
Lota lota			430764	Hart 1967
Lota lota	14	4715		Hevson 1955
Lota lota	8	2778	1362077	Lawler 1963
Lota lota	16	34020	1000000	McPhail and Lindsey 1970
Melanogrammus aeglefinus		900	375700	Hislop et al 1978
Melanogrammus aeglefinus	15		2460000	Hodder 1963
Melanogrammus aeglefinus	15			Kohler 1959
Merluccius productus	17			Beamish 1979
Merluccius productus	8			Swartzman et al 1983
Microgadus tomcod			31640	Schaner and Sherman 1960
GASTEROSTEIDAE				
Gasterosteus aculeatus	1	1		Allen and Wootton 1982
HIODONTIDAE				
Hiodon tergisus	8	425	20000	Carlander 1969
Hiodon tergisus	9	400		Glenn 1975
Hiodon tergisus	7	363		Van Oosten 1961
ICTALURIDAE				
Ictalurus melas	9	1474	6820	Carlander 1969
Ictalurus melas			3500	Dennison and Bulkley 1972
Ictalurus platycephalus	7	241	1742	Olmsted and Cloutman 1979
Ictalurus punctatus	12	5112	4570	Appelget and Smith 1950
Ictalurus punctatus	22	24948	70000	Carlander 1969
Ictalurus punctatus		11340		Eddy and Underhill 1974
Ictalurus punctatus	09	1232		Purkett 1957

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Ictalurus punctatus	8			Sneed 1950
Pylodictis olivaris	19	43090	11300	Carlander 1969
Pylodictis olivaris		45360		Eddy and Underhill 1974
Pylodictis olivaris	8	5251		Mayhew 1969
Pylodictis olivaris	8	7296	9200	Minckley and Deacon 1959
Pylodictis olivaris	9			Purkett 1957
ISTIOPHORIDAE				
Tetrapturus albidus		60781		De Sylva and Davis 1963
LABRIDAE				
Tautoga onites	27	2184		Cooper 1967
LEPISOSTEIDAE				
Lepisosteus osseus	22	18371	77156	Eddy and Underhill 1974
Lepisosteus osseus	15	2658		Klassen and Morgan 1974
LUTJANIDAE				
Lutjanus campechanus	16			Nelson and Manooch 1982
Ocyurus chrysurus	14	13698		Johnson 1983
Rhomboplites aurorubens	10	2869		Grimes 1978
MALACANTHIDAE				
Caulolatilus microps	15			Ross and Huntsman 1982
MYCTOPHIDAE				
Stenobrachius leucopsarus	8			Smoker and Pearcy 1970
OSMERIDAE				
Mallotus villosus	4			Baily et al 1977
Mallotus villosus	5			Baily et al 1977
Mallotus villosus			63300	Winters 1971

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Osmerus mordax	6	131	31388	Bailey 1964
Osmerus mordax	5		20570	Baldwin 1948
Osmerus mordax	5	50		Burbidge 1969
Osmerus mordax	7	142	69600	Carlander 1969
Osmerus mordax	5			Rupp 1959
Osmerus mordax		454		Schrenkeisen 1963
PERCICHTHYIDAE				
Morone americana	5			Busch et al 1977
Morone americana	7			Marcy and Richards 1974
Morone chrysops		800	473000	Newton and Kilambi 1973
Morone chrysops	8	430		Priegel 1971
Morone mississippiensis	6	455		Priegel 1975
Morone saxatalis	17			Chapoton and Sykes 1961
Morone saxatilis		56700		Schrenkeisen 1963
Roccus americana	10		247681	Sheri and Power 1968
PERCIDAE				
Etheostoma blennius		68	134	Burr 1979
Etheostoma camurum			100	Mount 1959
Etheostoma nigrum nigrum			164	Speare 1965
Etheostoma olmstedi	3	3	275	Tsai 1972
Etheostoma spectabile			200	Hubbs 1958
Etheostoma vitreum			223	Winn and Picciolo 1960
Perca flavescens	10	331		Beckman 1946
Perca flavescens	7	1641	100000	Brazo et al 1975
Perca flavescens	11	680	48000	Carlander 1949

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Perca flavescens		453	48000	Eddy and Underhill 1974
Perca flavescens	15	412		Fortin and Magnin 1972
Perca flavescens	5			Joeris 1956
Perca flavescens	8	1814	41000	McPhail and Lindsey 1970
Perca flavescens		1814		Schrenkeisen 1963
Percina caprodes			1700	Hubbs 1958
Percina peltata			125	New 1966
Stizostedion canadense	10	765	46000	Carlander 1949
Stizostedion canadense	20	4536	50000	Eddy and Underhill 1974
Stizostedion vitreum vitreum	6			Carlander et al 1960
Stizostedion vitreum vitreum	12			Carlander et al 1961
Stizostedion vitreum vitreum		6804		Eddy and Underhill 1974
Stizostedion vitreum vitreum			119180	Forney 1976
Stizostedion vitreum vitreum	6			Kelso and Ward 1972
Stizostedion vitreum vitreum	16	11340	600000	McPhail and Lindsey 1970
Stizostedion vitreum vitreum				Olson 1957
Stizostedion vitreum vitreum		11340		Schrenkeisen 1963
Stizostedion vitreum vitreum	10			Smith and Pycha 1961
Stizostedion vitreum vitreum	11			Smith et al 1951
Stizostedion vitreum vitreum	7			Serns and Kempinger 1981
Stizostedion vitreum vitreum	11	6309	614000	Wolfert 1969
PERCOPSIDAE				
Percopsis omiscomaycus	8	31	1329	House and Wells 1973
PETROMYZONTIDAE				
Lampetra appendix	5		2883	Seagle and Nagel 1982

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
PHOLIDAE				
Pholis gunnellus	5	15	404	Sawyer 1967
PLEURONECTIDAE				
Glyptocephalus cynoglossus	24			Bowering 1976
Glyptocephalus cynoglossus	26	2100	950000	Bowering 1978
Hippoglossoides platessoides			1449695	Pitt 1964
Hippoglossoides platessoides	28			Pitt 1967
Hippoglossoides platessoides				Powles 1965
Limanda Ferruginea	12			Pitt 1974
Limanda ferruginea			4570000	Pitt 1971
Microstomus pacificus	24			Demory 1972
Pseudopleuronectes americanus	13	1163	1531953	Kennedy and Steele 1971
Pseudopleuronectes americanus			3329000	Topp 1968
Reinhardtius hippoglossoides	23		215000	Lear 1970
Reinhardtius hippoglossoides	14			Lear and Pitt 1975
POLYODONTIDAE				
Polyodon spathula	15			Pasch et al 1980
RACHYCENTRIDAE				
Rachycentron canadum	10	3597		Richards 1967
RAJIDAE				
Raja erinacea	8	748		Waring 1984
SALMONIDAE				
Coregonus alpenae	9	642		Jobes 1964
Coregonus clupeaformis		1774	49114	Bidgood 1974
Coregonus clupeaformis	7			Christie 1963

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Coregonus clupeaformis		9072		Eddy and Underhill 1974
Coregonus clupeaformis	14	764		Edsall 1960
Coregonus clupeaformis	12			Fenderson 1964
Coregonus clupeaformis	14	2200	33400	Healey 1978
Coregonus clupeaformis	14	1480		Healey 1980
Coregonus clupeaformis			69000	Healey 1984
Coregonus clupeaformis	13		69000	Healey and Nicol 1975
Coregonus clupeaformis				Henderson et al 1983
Coregonus clupeaformis	16	2612		Kennedy 1963
Coregonus clupeaformis	28			McPhail and Lindsey 1970
Coregonus clupeaformis	18			Mills and Beamish 1980
Coregonus clupeaformis	17		35900	Morin et al 1982
Coregonus clupeaformis	9	2959		Peterka and Smith 1970
Coregonus clupeaformis	19	2721	67200	Qadri 1968
Coregonus clupeaformis		10433		Schrenkeisen 1963
Coregonus clupeaformis	16	3064		Van Oosten and Hile 1947
Coregonus hoyi			18768	Emery and Brown 1978
Coregonus hoyi	10			Lindsey and Woods 1970
Coregonus nasus	18	16000		Muth 1969
Coregonus pidschian	14	805		Alt 1979
Oncorhunchus gorbuscha		4546		Eddy and Underhill 1974
Oncorhunchus gorbuscha	3	6350	2000	McPhail and Lindsey 1970
Oncorhynchus gorbuscha	4	680	1060	Kwain 1982
Oncorhynchus gorbuscha		2268		Schrenkeisen 1963

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Oncorhynchus keta	22			La Lanne and Safsten 1969
Oncorhynchus keta		14061	4000	McPhail and Lindsey 1970
Oncorhynchus keta		9072		Schrenkeisen 1963
Oncorhynchus kisutch		14969		Eddy and Underhill 1974
Oncorhynchus kisutch	5	6350	2000	McPhail and Lindsey 1970
Oncorhynchus kisutch		13608		Schrenkeisen 1963
Oncorhynchus kisutch		2250	3500	Stauffer 1976
Oncorhynchus nerka		7031	4000	McPhail and Lindsey 1970
Oncorhynchus nerka		2206		Parker 1963
Oncorhynchus nerka	6	2223		Ricker 1962
Oncorhynchus nerka		5443		Schrenkeisen 1963
Oncorhynchus tshawytscha	4			Berg 1978
Oncorhynchus tshawytscha		56700		Eddy and Underhill 1974
Oncorhynchus tshawytscha		57154	8000	McPhail and Lindsey 1970
Oncorhynchus tshawytscha		45360		Schrenkeisen 1963
Oncorhynchus tshawytscha			3753	Wales and Coots 1954
Prosopium artedi	13		49000	Morin et al 1982
Prosopium coulteri		20	290	Bird and Roberson 1979
Prosopium coulteri	7	22	338	Eschmeyer and Bailey 1954
Prosopium coulteri	9			McCart 1965
Prosopium cylandraceum	14	2041	20000	McPhail and Lindsey 1970
Prosopium cylindraceum	14	7138		Jessop and Power 1973
Prosopium cylindraceum	12	876		Mackay and Power 1968
Prosopium cylindraceum	12			Morin et al 1982
Prosopium cylindraceum	7			Mraz 1964

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Prosopium williamsoni	18	2268	3570	McPhail and Lindsey 1970
Prosopium williamsoni	10			Pettit and Wallace 1975
Salmo clarki	10			Armstrong 1971
Salmo clarki	6			Bjornn 1961
Salmo clarki	3			Fleener 1951
Salmo clarki	6	2233	2140	Irving 1954
Salmo clarki		2721		Schrenkeisen 1963
Salmo clarki	10			Sumner 1962
Salmo gairdneri		1276	3459	Allen and Sanger 1960
Salmo gairdneri			5900	Bulkley 1967
Salmo gairdneri		22680	3000	Eddy and Underhill 1974
Salmo gairdneri	7			Kathrein 1950
Salmo gairdneri	6	23587	7600	McPhail and Lindsey 1970
Salmo gairdneri	4	568	2505	Scott 1962
Salmo gairdneri	3	464		Whoriskey et al 1981
Salmo salar			207548	Baum and Meister 1971
Salmo salar	11			Chadwick 1982
Salmo salar		27216		Eddy and Underhill 1974
Salmo salar			63400	Jarrams 1979
Salmo salar	8			Kazakov 1981
Salmo salar	10	6910	8024	Lee and Power 1976
Salmo salar		4000		Scarnecchia 1983
Salmo salar		45360		Schrenkeisen 1963
Salmo salar	10	3900		Warner 1962
Salmo trutta	7	1800		Campbell 1977

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Salmo trutta	24	8200		Campbell 1979
Salmo trutta			20865	Carlander 1969
Salmo trutta	10	870		Craig 1982
Salmo trutta		13608		Eddy and Underhill 1974
Salmo trutta	7	17917	9000	Holcik and Mihalik 1968
Salmo trutta			59400	Jarrams 1979
Salmo trutta	9			Kathrein 1950
Salmo trutta				NcFadden and Cooper 1962
Salmo trutta	8			Sigler 1951
Salmo trutta	4	713		Treasurer 1976
Salmo trutta	13	9698		Went 1979
Salvelinus alpinus	16	4045		Andrews and Lear 1956
Salvelinus alpinus		510		Jensen 1981
Salvelinus alpinus	10		1119	Jonsson and Hindar 1982
Salvelinus alpinus	8		199	McCart and Craig 1973
Salvelinus alpinus	24	11800	7200	McPhail and Lindsey 1970
Salvelinus alpinus	19	3500	7000	Moore 1975
Salvelinus alpinus	20	1000		Moore and Moore 1974
Salvelinus alpinus		1850	4038	Thompson 1959
Salvelinus fontinalis		6577	4800	Eddy adn Underhill 1974
Salvelinus fontinalis	5			Flick and Webster 1975
Salvelinus fontinalis				Latta 1963
Salvelinus fontinalis	4		2086	McFadden et al 1967
Salvelinus fontinalis	7	6600	5000	McPhail and Lindsey 1970

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Salvelinus fontinalis	7	536	1203	Saunders and Power 1970
Salvelinus fontinalis		4082		Schrenkeisen 1963
Salvelinus fontinalis			4765	Vladykov 1956
Salvelinus fontinalis	4			Warner 1970
Salvelinus malma			3086	Blackett 1973
Salvelinus malma		14400	8000	McPhail and Lindsey 1970
Salvelinus malma	11			Reed 1967
Salvelinus malma		9072		Schrenkeisen 1963
Salvelinus namaycush	17			Bulkley 1960
Salvelinus namaycush	9			DeRoche and Bond 1955
Salvelinus namaycush		28577	6000	Eddy and Underhill 1974
Salvelinus namaycush			8426	Eschmeyer 1954
Salvelinus namaycush		8400	4090	Healey 1978
Salvelinus namaycush	27	14968	16900	Kennedy 1954
Salvelinus namaycush	10			Lawrie 1963
Salvelinus namaycush	25			MacLean et al 1981
Salvelinus namaycush	25	46400	17000	McPhail and Lindsey 1970
Salvelinus namaycush	11	2052	2052	Rahrer 1965
Salvelinus namaycush	12	8326		Rahrer 1967
Salvelinus namaycush	16			Sakagawa and Pycha 1971
Salvelinus namaycush		45360		Schrenkeisen 1963
Salvelinus namaycush	8			Webster et al 1960
Stenodus leucichthys	20	27000		Alt 1973
Thymallus arcticus			12946	Carlander 1969
Thymallus arcticus	16	886		Craig and Poulin 1975

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
Thymallus arcticus	12	2500	10000	McPhail and Lindsey 1970
SCIAENIDAE				
Aplodinotus grunniens	9			Butler and Smith 1949
Aplodinotus grunniens		22680		Eddy and Underhill 1974
Aplodinotus grunniens	10	997		Priegel 1969
Aplodinotus grunniens	9	1828		Purkett 1957
Aplodinotus grunniens		27216		Schrenkeisen 1963
Aplodinotus grunniens	9	670	49300	Swedberg and Walburg 1970
Aplodinotus grunniens		11570		Witt 1960
Cynoscion nebulosus	8			Iversen and Tabb 1962
Cynoscion nebulosus			16688	Sundararaj et al 1961
Pogonias cromis	10	17000		Richards 1973
SCOMBRIDAE				
Thunnus alalunga	8	14411		Partlo 1955
SCORPAENIDAE				
Sebastes alutus	21			Gunderson 1974
Sebastes alutus	24	388		Westerheim 1973
Sebastes alutus		1515		Westerheim et al 1974
Sebastes emphaeus	4	59	59543	Moulton 1975
Sebastes flavidus	20			Kimura et al 1979
SERRANIDAE				
Mycteroperca microlepis	13	2161		Manooch et al 1978
SOLEIDAE				
Trinectes maculatus	6			Koski 1978

Table 1. (Cntd.)

FAMILY Species	Age	Wt.	Fec.	Reference
SQUALIDAE				
Squalus acanthias	70		7	Jones and Green 1977
Squalus acanthias	30			Jones and Green 1977
Squalus acanthias			13	Ketchen 1972
Squalus acanthias	95		8	Ketchen 1975
STICHAEIDAE				
Stichaeus punctatus	6	17	2475	Farwell et al 1976
TRIGLIDAE				
Prionotus evolans	3	995		McEachran and Davis 1970
UMBRIDAE				
Dallia pectoralis	3	37		Blackett 1962

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